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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/700,327

11/03/2003

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YOR920030196US1

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05/12/2008

EXAMINER

WILCZEWSKI, MARY A

ART UNIT

PAPER NUMBER

2822

MAIL DATE

DELIVERY MODE

05/12/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/700,327	Applicant(s) ANDRY ET AL.	
	Examiner M. Wilczewski	Art Unit 2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-39 is/are pending in the application.
- 4a) Of the above claim(s) 18-20 and 24-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-15, 21-23 and 28-39 is/are rejected.
- 7) ☒ Claim(s) 16 and 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
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| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>14 January 2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office action is in response to the Amendment filed on 17 January 2008. Claims 12-39 are pending in this application. Claims 18-20 and 24-27 are withdrawn from consideration. Claims 1-11 have been cancelled. Claims 37-39 are newly presented.

Response to Arguments

Applicant's arguments with respect to claims 12-36 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12-15, 23, 28-30, and 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pedigo, US Patent 6,506,332, in view of Okuno et al., the article entitled *Filling the via hole of IC by VPES (Vacuum Printing Encapsulation Systems) for stacked chip (3D Packaging)*, both cited by Applicant.

Pedigo discloses a filling apparatus (figures 1 and 2A-2D) for filling vias in a substrate 130 that comprises a surface 180 upon which to place the substrate 130; a paste delivery portion 142 for providing a paste to fill the vias; and a paste filling portion

200 for bringing the paste into contact with the vias under pressure so that the paste fills the vias (see Summary of the Invention, columns 4-5). Pedigo lacks anticipation only of providing a chamber in which to place the substrate, wherein the chamber is capable of being evacuated. However, Okuno et al. teach that it is advantageous to use perform the printing operation in a vacuum in order to prevent the formation of voids in small vias, see section 2) Filling Sample by VPES on the fourth page of the article. In light of the recognition by Okuno et al. of the benefits of printing under a vacuum (see also page 7, line 21, bridging page 8 to line 23 of Applicant's specification), it would have been obvious to one skilled in the art to place the printing apparatus of Pedigo in a chamber capable of being evacuated in order to prevent the formation of voids during the filling of the vias.

Although Pedigo disclose that substrate 130 can be a plate, printed circuit board or electronics package (column 15, lines 12-17), Pedigo does not expressly disclose a wafer. However, it is well known that the material worked upon does not limit apparatus claims, and are of no significance in determining the patentability of an apparatus claim. The purpose to which an apparatus is to be put or expressions relating the apparatus to contents thereof during an intended operation are of not significant in determining patentability of the apparatus claim. Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, the inclusion of the material worked upon by a structure being claimed does not impart patentability to the claims. In re Young, 25 USPQ 69 (CCPA 1935) (as restated in In re Otto, 136 USPQ 458, 459 (CCPA 1963)). In addition, it would

have been obvious to one skilled in the art that an electronics package can comprise a wafer.

The paste filling portion 200 is shown in figures 3, 3A, 4, 4A, 5, and 5A. Paste filling portion 200 has a planar surface 230 onto which the paste is deposited and a mechanism 154 for applying pressure so that the paste is forced into contact with the substrate 130. The paste delivery portion 142 of the apparatus of Pedigo includes a passageway 120 and 120' through which paste is delivered to the surface of the substrate, see figures 1 and 2A-2C. As shown in figures 10A-10C of Pedigo, the paste delivery portion 142 comprises a pressurized paste reservoir.

Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pedigo, US Patent 6,506,332, in view of Okuno et al., the article entitled *Filling the via hole of IC by VPES (Vacuum Printing Encapsulation Systems) for stacked chip (3D Packaging)*, as applied to claim 12 above, and further in view of Sakaida et al., US Patent 6,695,020, and Kanno et al., US Patent 6,243,251, both of record.

Pedigo is applied as above. Pedigo lacks anticipation of using a base plate having a recess in it for the substrate or of using an electrostatic chuck. Sakaida et al. disclose an apparatus for filling vias in a substrate in which the base plate of the apparatus has a recess for accommodating the substrate, see figure 7. It would have been obvious to one skilled in the art to form a recess in the base plate in the known apparatus of Pedigo in order to stabilize the substrate during the filling operation so that

the substrate does not move when the pressurized paste filling portion brings the paste into contact with the substrate.

Concerning claim 22 (which depends from claim 21), the advantages of electrostatic chucks are well known in the art, see Kanno et al., column 1, lines 42-57. Since an electrostatic chuck permits the surface of a substrate to be processed without being mechanically contacted by the chuck, any contamination of the substrate can be prevented. Therefore in light of the teachings of Kanno et al., it would have been obvious to one skilled in the art to substitute an electrostatic chuck for the base plate used in the known apparatus of Sakaida et al. Therefore, in light of Sakaida et al. and Kanno et al., it would have been obvious to use an electrostatic chuck with a base plate having a recess for accommodating the substrate for the base plate used in the known apparatus of Pedigo thereby ensuring an undamaged substrate having properly filled vias.

Claims 31-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pedigo, US Patent 6,506,332, in view of Okuno et al., the article entitled *Filling the via hole of IC by VPES (Vacuum Printing Encapsulation Systems) for stacked chip (3D Packaging)*, as applied to claims 28 and 30 above, and further in view of Vinciarelli, US Patent 5,720,324, of record.

Pedigo is applied as above. Pedigo lacks anticipation of using a rotating base. Vinciarelli discloses an apparatus for filling a free space (via) within an assembly with flowable material in which the base is rotated, see figure 4. By rotating the base in the

known apparatus of Vinciarelli, a centrifugal force is imposed on the flowable material causing it to be forced outward into the free space (via), see figures 6B-6E; column 2, lines 42-53; and column 6, lines 10-23. It would have been obvious to one skilled in the art to provide a rotating base in the known apparatus of Pedigo in order to produce an outward force that will impose a centrifugal force on the paste, which is a flowable material, thereby ensuring the complete filling of the vias in the substrate.

Allowable Subject Matter

Claims 16 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Wilczewski whose telephone number is (571) 272-1849. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. Wilczewski/
Primary Examiner
Art Unit 2822

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